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TRANSPORTATION

No. 70

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DEPUTY MINISTER DISCUSSES DEVELOPMENT OF AEROFLOT'S TECHNICAL BASE

Moscow SOVIET MILITARY REVIEW in English No 8, Aug 81 pp 7-10

[Interview with B. Ye. Panyukov, deputy minister of civil aviation, by Capt. A. Sholokhov--place and date not given]

[Text]

The introduction of new technical equipment is one of the most important features in the development of civil aviation in the present five- and ten-year periods. This process is in full swing. The cargo giant Il-76T, which carries all kinds of machinery and bulky freight weighing up to 40 tons, has begun regular flights. With the help of the mechanised equipment it carries the aircraft can be loaded and unloaded in a short time. It can be used on airfields without a hard surface at very low temperatures.

Regular flights have started with the first Soviet airbus, the 350-seater Il-86, intended mainly for lines with dense flow of passengers, and an aeroplane for short distance main lines, the 120-seater Yak-42.

What kind of machines are they? The wide-fuselaged Il-86 with a maximum commercial load is used on lines of up to four thousand kilometres long. Its cruising speed is 900-950 kilometres an hour. It presents no great exploitation difficulties and is not expensive to maintain. Although the plane's take-off mass is 206 tons, the structure of the undercarriage makes it possible to raise considerably its take-off and landing characteristics.

The machine is comfortable. It has three built-in ramps and three salons on the upper deck.

The liners' passenger salons are beautifully finished in modern non-inflammable materials. There are three rows of cozy chairs and wide gangways. Another important thing is that the Il-86 can be quickly re-equipped to carry freight if necessary.

The speed of the other new Soviet aeroplane, the Yak-42, is 820 kilometres an hour. It is powered by three turbofan jet engines with low fuel consumption, and therefore highly economical.

The two built-in ramps considerably lessen the time of embarkation and disembarkation. The salons are finished in non-flammable plastic materials. The Yak-42 will gradually replace such machines as Tu-134 and An-24 on the Aeroflot lines.

Much attention is likewise being paid to the development of local lines. The "microbus" — 15-seater AN-28 — a comfortable two-engined machine, which is to replace the good old AN-2, is undergoing tests.

And what is being done in the field of capital construction? What new airports and terminals is it planned to put into operation in the Eleventh Five-Year-Plan period?

The Aeroflot lines connect 3,600 cities and inhabited localities in this country and 105 capitals and major centres in 85 foreign states. The big volume of work being done by Aeroflot would be inconceivable without an extensive system of aerodromes and a reliable material and technical basis at airports. In the Tenth Five-Year-Plan period 28 runways were built or reconstructed. Large-scale modern airport terminal complexes were commissioned in Moscow, Tallin, Frunze and other cities.

Recently, in a number of other cities too airports capable of receiving modern aeroplanes were built. A new airport terminal complex, Sheremetyevo-2, capable of servicing 2,100 passengers an hour, was put into operation.

In the Eleventh Five-Year-Plan period development of the system of airports on the main and local air lines and the building and reconstruction of aircraft repair facilities and civil aviation air-technical bases, especially in the North, Siberia and the Far East, is continuing.

One of the biggest projects begun in recent years and to be completed in the current five-year period, is the airport terminal complex of the Zapadny (Western) Airport in Yerevan. It will really embellish the air gates of Soviet Armenia's capital. It is distinguished by its progressive technological design and the utilisation of the most up-to-date construction equipment.

The building of a new airport with terminal, original in architecture, planning and construction solution, is proceeding in Minsk, capital of Byelorussia. Extensive mechanisation of technological production processes is envisaged here.

During these five years it is planned to increase the capacity of the airport in Khabarovsk, one of the largest aviation junctions in the Far East to one and a half thousand passengers an hour.

The comfort of air transport, to which one has become used in normal regions, is spreading towards one of the country's northernmost points — Pevek Airport. Here, in the land of bitter cold and eternal frost, an office and passenger complex will be built, including, besides the airport terminal, a hotel, a kitchen for meals during flights and a control tower.

And finally, projects of new large-scale and complex terminal buildings in the capital's Domodedovo Airport, and also in the southern health resorts — Sochi, Mineralnye Vody and Simferopol — are being drawn up.

The introduction of new technical equipment envisages not only the reconstruction of functioning and construction of new airports and terminals, but also their equipping with means of automation and mechanisation of transport processes, maintenance of aircraft and service of passengers. What can you say about this?

It is envisaged to introduce on an extensive scale air and ground systems of navigational and radar equipment, ensuring automation of air traffic control, take-off and landing of planes and increasing the safety of flights.

In large airports one specialist controls twenty aircraft simultaneously. Therefore it is easy to understand why an automatic system of flight control is indispensable. Such systems are already functioning in various cities.

One such system — "Start" makes the controller's work of collecting and processing data considerably easier. The "Start" computer system, capable of simultaneously controlling the movement of 36 aircraft in the airport's flight zone and of two, coming in to land, receives information from various sources.

In the Eleventh Five-Year-Plan period systems like "Start" will be introduced in the country's largest airports. One such flight movement control system has begun operating in the most intensive zone — that of the USSR's capital.

In some airports a light-signalling system of runway marking has begun to operate.

Recently a new radio-electronic apparatus showing the air situation was tested in Vilnius. This installation allows the controller to see on the screen the necessary data coming from several aircraft at once and to take effective and optimum decisions.

The introduction of the new equipment will make it possible to raise the regularity of flights and therefore to considerably improve the passenger service.

The "Sirena" automatic system of selling and reserving tickets likewise raises the quality of service. Its memory contains a variety of data on the movement schedule, the types of aircraft on the different flights, availability of seats and much more. On request the "Sirena" will give any information and print a ticket in just 3-5 minutes.

An All-Union automatic control system of ticket sales and seat reservation (ASU-5) is being created and introduced. It will consist of several so-called zonal subsystems whose boundaries coincide with the boundaries of civil aviation control. The subsystems will control ticket sales and reservations for flights beginning in the airports of the zone and performed in or beyond that zone.

It is true that the 26th CPSU Congress set big tasks before Aeroflot, the world's largest aviation company. In your answers, Boris Yegorovich, one feels a firm conviction that they will be solved successfully. On what is that conviction based?

Naturally, on the achievements in the ended Tenth Five-Year-Plan period and in the first months of the Eleventh. I will mention only a few facts. In 1976-1980 Aeroflot carried half a milliard passengers and 14 million tons of urgent national-economic freight and mail. The share of air transport in interurban communication rose from 28 to 33 per cent. In agriculture it helped to cultivate over 460 million hectares of fields. Almost 40 per cent of the general volume of work in applying chemical fertilisers in the country's fields was carried out by aircraft of the agricultural aviation. The planned tasks of its use in other spheres of the economy were considerably overfulfilled. The aviators' contribution is especially great in opening up and developing the oil and gas deposits in Tyumen and Western Siberia.

Civil aviation today has become a highly paying sphere of national economy, the utilisation of the basic production funds has improved and the specific fuel consumption has been lowered.

Modern liners Il-62, Tu-154 and Tu-134, notable for their high flight and technical characteristics and comfort, have appeared on many air routes. The bulk of passenger transportation is performed on these machines.

In the Eleventh Five-Year-Plan period the aviators are doing everything to ensure the full and timely satisfaction of the requirements of the national economy and the population in transportation and other types of aviation service. It is planned to increase passenger transportation about 1.3 times, to deliver millions of tons of freight and mail and to apply fertilisers from the air on enormous cultivated areas.

Our confidence that we will fulfil everything planned is also based on the high labour enthusiasm of the country's aviators. They have assumed the obligation to make Aeroflot the model for all transportation. We are still directing all our efforts at making more effective the utilisation of the aviation fleet and material-technological resources. This is a struggle to improve the quality of service, for strict economy of fuel and energetic resources.

A complex programme for lowering fuel consumption by the main fleet of civil aircraft has been worked out by the Ministry of Civil Aviation jointly with the aviation industry. Work is being done to straighten out flight routes, to use the most advantageous flight ceilings with due regard for the change over to the new distribution of flight levels system.

We are paying great attention to further improving planning and ensuring rational use of everything at the disposal of Aeroflot. In this we are guided mainly by intensive factors of the rise in the volume of transportation and other kinds of aviation work in the national economy and are more introducing scientific and technological achievements and advanced experience into production.

The civil aviators are fully resolved to put into life the decisions of the 26th CPSU Congress, to fulfil with honour their plans and obligations and to complete successfully the tasks of the first year of the Eleventh Five-Year Plan.

CSO: 1812/35

SCIENTIFIC-TECHNICAL PROGRESS SERVING RAILROAD TRANSPORT

Moscow ZHELEZNODOROZHNYY TRANSPORT in Russian No 6 Jun 81 pp 2-13

[Article by K. V. Kulayev, deputy minister of Railways USSR: The Decisions of the 26th CPSU Congress Implemented--By the Path of Scientific-Technical Progress"]

[Text] The successful accomplishment of the important and crucial tasks assigned to railroad transport by the Communist Party and the Soviet government requires all-round development of technical progress on the railroads, extensive and efficient use of the achievements of modern science and technology, and expansion and intensification of the interrelationships between the scientists and the practical workers. "The context in which the national economy will develop in the 1980's," declared Comrade L. I. Brezhnev at the 26th CPSU Congress, "makes it even more imperative to accelerate scientific-technical progress. The party of communists is proceeding on the basis of the premise that the building of a new society is simply unthinkable without science." This applies in full measure to railroad transport and its material and technical base, the development of which will be implemented in accordance with the CPSU Central Committee and USSR Council of Ministers decree on "Measures for improvement of the operation of railroad transport and for its over-all development in the 1981-1985 period."

In the acceleration of scientific-technical progress in railroad transport a leading role is played by the main administration of the MPS [Ministry of Railways], the collectives of four scientific research institues and 15 transport higher educational institutions, and the planning and design organizations. Being implemented in accordance with the ongoing research and development is the overall development of railroad transport, its network, the designing of the track and rolling stock, the automation and communications facilities, the power supply installations, and the various machines and mechanisms. The scientific collectives of the institutes do research on the subjects of improvement of the management of the work of the railroads and the enterprises and the organization and technology of the transport process.

The railroads of the USSR cooperate on a broad scale with foreign railroads, a cooperation which furthers scientific-technical progress in railroad transport and better preparation for international shipments. Being developed in the most active fashion is the cooperation with the railroads of the socialist countries on a multifaceted basis within the CEMA Permanent Commission for Transport, the Railroad Cooperation Organization (OSZhD), the Over-All Freight Car Fleet (OPV), and other organizations as well as cooperation carried out on a bilateral basis.

The development of the material and technical base of railroad transport aims primarily for further increase of the carrying and traffic capacity of the mainlines and the traffic and processing capacity of the sorting, sector and freight stations. Special attention is being given to the mechanization and automation of the labor-intensive production processes, improvement of the structure of the locomotive and car fleets, expansion of the repair base of the locomotive and car organizations, and further enhancement of the reliability of the basic technical facilities.

The Chief Policy Trend--Electrification

In the technical retooling of railroad transport and the attainment of further increase in the carrying and traffic capacity of the freight traffic lines a decisive role will be played, as in past years, by electrification. Electrification of the steel lines represents a systematic realization of the Leninist ideas of all-out electrification of the country as set forth in the plan of the GOELRO [State Commission for the Electrification of Russia], the 60th anniversary of which was observed in December 1980.

At the present time 43,700 kilometers of lines in our country are electrified; this comprises 31 percent of the entire railroad network. The proportion of shipments carried out on electric traction is 54.7 percent and the 1980 average freight traffic of the electrified lines reached 46.1 million net tons a year as compared to 16.3 million tons in sectors with diesel traction and an average of 25 million tons for the network. Our electrified lines, which in length comprise only 3 percent of the world network of railroads, carry out more than 25 percent of all the world's railroad shipments.

The operational experience acquired in our country has revealed a number of important merits and indisputable advantages of electric traction as compared to the other means of traction employed on the railroads. The reliability of the electric traction units, including the electric rolling stock and the power supply system, proved to be 2.7 times greater, the transport operation cost 16 percent less, and the labor productivity 10 percent higher than the corresponding indicators for diesel traction.

The entire history of the electrification of railroads in our country gives convincing evidence of the fact that the characteristic feature of electric traction is its continuous technical change and improvement. Thus, the rotary converters installed at the traction substations of the first electrified sectors were soon replaced by the mercury rectifiers (in the 1930's) and the 1960-1970's saw the widespread introduction of semiconductors, and at first uncontrolled and then controlled converters (thyristors). Whereas the first suburban sectors were electrified at a voltage of 1.65 kilovolts (kv), the subsequent ones employed a 3.3 kv direct current system and later a 27.5 kv alternating current. We have now begun to introduce an even more sophisticated system of 2 x 27.5 kv alternating current. The contact relay telemechanics systems which were used previously in the electrified sectors were replaced by electronic devices and then by the more sophisticated and reliable Lisna system. Undergoing testing is a telemechanical control system employing integrated circuits.

The next few years will see the taking of major steps on the path to introduction in the electrification operation of qualitatively new equipment such as vacuum circuit breakers, microprocessors, semiconductor valves of 40-50 sizes, boltless combinations of wires, welding of wires using blasting energy, etc. In all, electric traction is a fruitful field for effective application of the latest achievements of science and technology.

Electrification not only provides for operation of the largest volumes of transport but it also optimizes the fuel and energy balance sheet of railroad transport. Estimates indicate that if diesel traction were used in place of electric, then the railroads' need for diesel fuel in 1980 would be increased by 12.5 million tons. In 1980 the saving of organic fuel as a result of electrification, counting the production of electric energy at the GES and AES installations, amounted (in conventional terms) to 1.7 million tons. It must also be borne in mind that the electric power stations use low-grade coal, peat, shale, gas, mazuts and other comparatively inexpensive types of energy resources and not good-quality diesel fuel.

All this again provides convincing evidence of the fact that electrification is the most effective basis for technological re-equipment of the railroads and the rates of introduction of electric traction should be stepped up by every possible means. The 11th Five-Year Plan calls for the electrification of 6,400 kilometers. The conversion to electric traction will take in the Transbaykal and Far East railroads (the Karymskoye-Bira line), the Kazanskiy and Vagayskiy lines, and the Karaganda-Mointy, Orsha-Brest, Tselinograd-Kokchetav-Peski, Tselinnyye-Utyak sectors. There will thus be established a Brest-Khabarovsk electrified supermainline, a second electrified egress from the Kuzbas and Ekibastuz to the Urals, and a third electrified line from the Urals to the Center.

In addition to a considerable increase in the traffic and carrying capacity on the lines being converted to electric traction and enhancement of the dependability of their operation, the newly electrified sectors will save during the five-year period approximately 7 million tons of diesel fuel (in physical terms), 2.1-2.3 million tons of organic fuel, and 670 million rubles of operational funds; and there will be a reduction of 8,000-8,500 persons in the operational personnel contingent. On the basis of the planned considerably increased production of electric energy at the AES and GES installations, the proportionate expenditure of organic fuel (per 10^4 ton/kilometers gross) on electrified lines will drop from 36.9 kg in 1980 to 33.4 kg in 1985 and the saving of conventional fuel (as compared to diesel fuel) for this measure of transport work will increase from 8.6 to 11.9 kg respectively.

Nearly 90 percent of the lines will be electrified on alternating current; this includes more than 1500 km on the 2 x 27.5 kv system. Electrification will be carried out with new, more sophisticated equipment embodying all the advances derived from the operational work for increasing the reliability of the system, this work to take into account the potentialities for reinforcing the power supply installations beyond the rated operational periods. In addition to the electrification of new lines, we will do important work to strengthen the sectors previously electrified.

The Great Potentialities of Effective Operation of Transport

An important factor in increasing transport capacities and improving the economic indicators for the work of the railroads is increased weight of the freight trains. In the 1976-1980 period the average gross weight of the trains increased by 87 tons and in 1980 exceeded 2,800 tons. This is primarily the result of increasing the capacity of the locomotives and stepping up their productivity, extending the station tracks in a number of sectors, and increasing the static load of the cars.

As a result of a number of measures devised and implemented for increasing the carrying capacity and improving the utilization of the cars, the static load increased in the last five years by 2.41 tons per car. Increasing the static load will in the future continue to be one of the chief ways to increase the average weight of the trains. This will be achieved, in particular, by the widespread introduction of eight-axle cars with increased linear loads and also by a fuller and more efficient use of the increased freight capacity of the cars. Thus, the 11th Five-Year Plan provides for the delivery of approximately 9,000 eight-axle open cars to the railroads.

The weight of the trains on particular lines is in many respects dependent on the length of the station tracks. In the 1976-1980 periods on the network of railroads the tracks were extended at more than 900 stations. Also, 1320 kilometers of additional rail lines were laid, 387 new station tracks were built, and at 32 stations work was carried out to extend the receiving and dispatching tracks to the standard lengths. All this has enabled us to increase the length of round-trip trains in areas extending more than 13,000 km. As a whole, in the past five-year plan, the weight of freight trains increased on more than 55,000 km of lines.

To provide for future increases of the length and weight of the freight trains, the 11th Five-Year Plan calls for continuing the work of extending the station tracks to the prescribed standard lengths at more than a thousand stations and increasing by 22,000 kilometers the area traversed by the lengthened trains.

The inadequate carrying capacity of a number of lines which expect a considerably increased future routing of coal, ore, petroleum, petroleum products and other important freight, is making it one of the chief tasks to increase the weight of the freight trains to 6,000 tons and more. This is especially important on the lines running from the Kuzbass and Ekibastuz, on the lines linking the Urals with the Center, the region of the Kursk magnetic anomaly with Lipetsk, and the Donets Basin with Krivoy Rog and the L'vov region.

In this connection we are doing thorough scientific research and engineering and economic work to ascertain the optimum solution to this problem, with due consideration given to every angle and with creative application of the CPSU Central Committee-approved work of the Moscow Railroad, which organized large-scale operation of trains of increased weight and length. We must above all set up first-priority lines on which we will organize movement of trains of increased weight and we must organize stage-by-stage fulfillment of the necessary work. In resolving the problem for each specific line we must take into account the quantity of freight which can be shipped in the trains of increased weight and we must evaluate the over-all economic effectiveness of this measure.

In this regard a number of tasks of a technical and organizational nature face the most important sectors of railroad transport. In the traffic operation we must work out a complex of measures pertaining to the formation of trains and compatible with the development of the stations and junctions, the traffic organization, and the system for regulating the operation of trains of increased weight. In the locomotive operation we must make provision for the operation of multiple traction with control by a multiple unit system; we must devise a dependable system for controlling several locomotives from a single operator's cabin; we must determine the maximum weights of trains in relation to the brakes and we must determine the potential for negotiating curves with different variants of distributions of the locomotives according to the length of the train. The railroad car workers must give special attention to the task of increasing the dependability of the automatic coupling facilities, the towing unit and the automatic brakes, and the organization of a more effective system of inspection and technical servicing of the cars. The workers of the electrification and power engineering industries must see to it that the capacities of the power supply installations are brought up to a level which will handle the traffic of trains of increased weight so as to optimize the process of their travel through the sectors. An urgent task in the track industry is the development and implementation of a complex of measures which will increase the service life of the rails and on this basis reduce the volumes of the work required for repair of the track.

In the organizing of a highly productive shipment process in railroad transport ever increasing importance attaches to the stations and junctions, which in a number of cases have become the decisive link in the transport conveyer. In the 26th CPSU Congress Comrade L. I. Brezhnev noted that the development of station tracks is an economical and rapid means of increasing the traffic capacity of the railroads. Consequently, improving the work of the stations and increasing their capacity and processing capability acquires particularly great importance in the context of the current situation.

In the 10th Five-Year Plan, in accordance with the CPSU Central Committee and USSR Council of Ministers decree on "Measures for the Development of Railroad Transport in the 1976-1980 Period" important work was carried out for developing and reinforcing the technical equipment of the stations and junctions and the railroad mainlines adjoining them; this was work aimed at increasing the over-all transport capacity of the appropriate lines. New sorting systems were set up at stations Yulemiste, Razdel'naya, Krasnyy Liman, Syzran', Arys', Bereznyaki-Sorting, Toki, Nasosnaya, Kurganka, Darnitsa and Kandagach. Additional development was obtained by the sorting stations of Khovrino, Smolensk-Sorting, Orekhovo-Zuyevo, Yudino, Izhevsk, Agryz, Lyangasovo, Znamenka, Osnova, Dzhankoy, Bataysk, Chelyabinsk, Altayskaya, Irkutsk, Karymskaya, Khabarovsk II, Anisovka, Likhaya, Poltava-Yuzhnaya, Khavast, Inskaya and others; also a number of port and border stations. Twenty-six sorting facilities were mechanized, 29 pneumatic postal units were built for forwarding freight documents at the sorting stations, and 11,400 changeover switches were equipped with electric centralization devices. On the whole, 705.4 million rubles were invested in the development of stations and junctions.

All this enables us to concentrate the sorting work at the stations with the best technical equipment and to bring the processing and removal to an average of 150 cars a day and in the case of the most important sorting stations to 250 and more cars a day.

This important work will be continued at stepped-up rates in the current five-year period. Also requiring special attention is the search for the most effective and comprehensive means of development of the traffic and transport capacity of the stations and sectors, finding out which elements of the transport system are in need of first-priority development, and making provision for the most efficient use of the substantial assets allotted for these purposes.

In 1981-1985 there will be accelerated development and technical re-equipping of the sorting stations and railroad junctions, the first work of this kind to be in Siberia and the Far East. In particular, provision is being made to complete the work for development of the stations Khabarovsk II, Angarsk, Inskaya and a number of others; also, to continue the work begun in the 10th Five-Year Plan on stations Tayshet, Achinsk I, Altayskaya, Irkutsk and others.

The development of the stations will be carried out in close coordination with the strengthening and improvement of their technical base. It is planned during the five-year period to equip 12,000 switches with electric centralization devices, to mechanize 38 sorting facilities, at 17 stations to mechanize the No 3 yard braking position, to build 40 pneumatic mail facilities for the delivery of freight documents, and other improvements. All this will help to increase the processing and traffic capacity of the stations and to step up the labor productivity of the station workers. In the 11th Five-Year Plan the total volume of capital investments for the development of the stations will amount to 880 million rubles; this includes the expenditure of 700 million rubles for construction and installation work.

The Potential of Automation, Means of Communication, and Computer Technology

Improvement of the automatic blocking devices and the dispatcher electrical centralization and communication continue to be one of the most important components of the development of technical progress on the railroads. The introduction into operational practice of the latest devices of automatics, telemechanics and communications is enabling us with relatively small capital investments and within brief periods to significantly increase the traffic capacity of the lines, to enhance the safety of the movement of trains, and to step up the labor productivity of the workers of the various services. The basic direction in the field of development of automation, telemechanics and communications is improvement of automatic blocking and locomotive signalization, dispatcher and electric centralization, line and radio communications, and the development of new systems and apparatuses employing noncontact equipment, electronic computers, microprocessors, and micro-EVM [electronic computers].

An important task in addition to this is making provision for uninterrupted operation of the existing facilities for automation, telemechanics and communications and increasing the reliability of their operation. At present considerable tardiness of the trains is causing unstable operation of the rail circuits. To increase the dependability of the automatic blocking operation with reduced electric resistance to the ballast, we have set up 25/12.5 GTs [hertz] rail circuits. Operational testing of this automatic blocking system is planned for the current year in the Konok-Iley sector of the Krasnoyarsk Railroad.

Considerable expansion of the technical and operational potentialities of the systems of intermediate control is making possible the application of the established system of automatic blocking and automatic locomotive signalization (ALS) for the lines with speed of movement up to 200 kilometers per hour. This system employs the frequency principles of information coding and noncontact semiconductor instruments which enable us to increase the valency of the signal readings. The ALS apparatus helps in the automation of control of the speed of movement, which, together with the increased traffic safety, makes it possible to improve the conditions of labor of the locomotive crews.

A most promising development is the essentially new centralized automatic blocking system (TsAB) without track signal lights with track circuits, without insulating joints, and with deployment of all the apparatus at the stations. The speed traffic control in this system will be based on the signals of the automatic locomotive signalization. In 1981 we will complete the equipping of the Kherson-Nikolayev automatic blocking sector on the Odessa Railroad.

The positioning of the track apparatus at the central posts and the elimination of the traffic signal lights and insulating joints from the complex of devices will enable us to significantly enhance the reliability of the system and to reduce the cost and the time required for the construction of automatic blocking installations as well as the operational expenditures for their maintenance. To improve the operation of the numerical code automatic blocking in current operation we have developed the BKPT noncontact code track transmitter, which has greater operational reliability than the existing transmitters.

One of the most effective devices of the STsB [signalization, centralization and blocking system] is the dispatcher centralization (DTs), which enables us to increase the traffic capacity of the lines, to step up the sector speed, and to reduce the operational personnel requirement. Currently in use as a model is the DTs system Neva, which can operate with air, cable and radio relay lines. This system is especially effective for ramified sectors and large centers because it does not require additional sets of apparatus at the DTs posts. All the apparatus is set up in standard racks (with plugs for switching on the instruments), which do not require individual planning.

The chief direction for further improvement of the DTs system is the satisfaction of the new, stepped-up operational requirements, including provision for dispatcher control of the switching operations, transfer of responsible crews for emergency setting of switches, adaptation of the route, and dispatch of an auxiliary shift to minimize delays of trains when there is a malfunction of the rail circuits. We have already completed the development and begun the introduction of the new Luch type DTs system, which possesses double the capacity for direction and control of the installations as compared to 1.3-fold capacity for the Neva. It also provides for doubling the speed of transmission of remote control signals and greater stability of the circuit units by the use of silicon semiconductor elements.

The routing and relay centralization which is gaining widespread introduction on the network of railroads is being continuously improved and its element base modernized. In particular, we have developed improved electric centralization

which we will test at station Rezekne on the Baltic Railroad. The maximum industrialization of planning and manufacture stipulated in this system is enabling us to cut down the construction time and cost.

The automation, telemechanics and communications units in use on our railroads are as a whole appropriate for the present-day requirements. At the same time, the level of their use of EVM, microprocessors and micro-EVM is still clearly inadequate. Elimination of this lag will enable us to increase the effectiveness of these units. In line with this we are preparing a fully developed program for the introduction in the 11th Five-Year Plan of modern electronic computer equipment in the STsB installations.

In light of the operational experience and on the basis of study of the work of the existing elevation automation installations we have prepared basic operational and technical requirements for fully automated breakup of trains in the mountainous areas. We are working on the development of an ASU-RSG [automatic control system for the breakup of trains in mountainous areas]; this system will use a control complex based on the SM-2 electronic computer. The ASU-RSG will be tied in with the automated control systems of the sorting stations (ASUSS) for purposes of exchange of information on the functioning of the sorting process. We plan to introduce the system on a test basis at station Yasinovataya of the Donets Railroad. The Rostov Institute of Railway Transport Engineers has done important work on the use of the micro-EVM in ASU-RSG and has established the procedure for deriving the necessary data for the electronic track diagram. This development is one of great practical interest and it has been decided to introduce it at one of the sorting stations.

Mainline communications are at present being carried out largely on aerial cable lines and are not meeting the present-day requirements. The chief task in this regard is to increase the number of channels and improve the quality of the communications. This is necessary so as to provide fully for the established networks of automatically commutated telephone and telegraph communications, the transmission of data for the ASUZhT [automatic control system for railroad transportation] and its subsystems, and operational and technological communications. This development can only be implemented by widespread introduction of modern mainline communications cable lines. As things stand, the current rates of replacement of the aerial lines with cable lines are clearly inadequate.

Work is in progress to develop a system of Astra type sectional communications designed to provide effective and reliable transport means for the technological processes in the work of all the railroad transport links. In the interests of efficient use of the communications facilities and cable resources and full satisfaction of railroad transport's need for high-quality communication channels we have prepared for the 11th Five-Year Plan and the future up to 1990 a general scheme of development of the communications networks on the railroads. This general scheme will help to engender a more effective and complete development of the communications network and means on the basis of a technical retooling which makes use of the achievements of modern science and technology.

In railroad transport recent years have seen a significant increase in the extent of introduction of radio facilities and an expansion of the scope of their use.

Since 1978 we have carried out work for the introduction of improved semiconductor radio stations of train radio communications--ZhR-UK-LP (locomotive) and ZhR-UK-SP (station), which operate on higher frequency bands and consequently possess better interference elimination features than the ZhR-3 and ZhR-3M radio stations used previously. To handle station radio communications we are introducing the new radio stations ZhR-U-SS (station) and ZhR-U-LS (locomotive), which operate on a metric band and make possible improved quality of communications and the elimination of outages within the territory of the stations.

To expand the technical and operational potentialities of radio communications we are preparing a comprehensive system of the "Transport" type. It encompasses train, station and operational repair radio communications. The system is set up on a modern element basis and uses microcircuits. The communications in this system will be carried out in a band of metric and decimetric waves which are less subject to the action of industrial interference in duplex and simplex modes. The "Transport" system enables us to expand considerably the scope of the use of radio communications in railroad transport and to provide for full satisfaction of the railroads' requirements for radio communication facilities with mobile installations.

Electronic computer equipment is obtaining ever increasing proliferation in the railroads. In progress is the development and stage-by-stage introduction of the industrial sector automated system of control of railroad transport (ASUZhT). Functioning within the framework of the ASUZhT are the main computation center of the MPS, the computation centers on the railroads, and a number of MPS plants for the repair of rolling stock and the production of spare parts.

On all the railroads we have set up and put into operation the first sections of the information and inquiry systems dealing with the freight work and rolling stock inventories and also the systems for keeping track of the group refrigerator rolling stock and the large-tonnage containers and for processing the data on the operational work. In operation on the individual roads is a control system for the operation of the closed circumferential routes.

To increase the processing capacity of the sorting stations we are establishing a network of automated control systems to monitor their work [ASUSS]. Twenty such systems are now in operation on the railroad network. In the 11th Five-Year Plan period ASUSS's will be set up at intercorresponding sorting stations of the most important railroad yards of the Gor'kiy, Kuybyshev, South Ural and Central Asian railroads as well as on roads of Siberia and the Far East.

We are expanding the use of EVM to increase the reliability of the technical facilities. On a number of roads we have worked out and, through the use of EVM, resolved problems connected with analysis of damages and unplanned repair of locomotives; also, diagnostic study of the technical condition of the diesel engines of locomotives and malfunctions of the STsB units. We plan in the future to set up railroad network information and inquiry systems with the capacity to automate the recording of malfunctions of railroad cars, locomotives and the upper structure of the track and on the basis of analysis of these records to make recommendations and draw up plans for preventive work. We plan to introduce systems of this kind in the current five-year period.

To increase the effectiveness of the use of computer equipment and to enhance the yield obtained from this equipment it is necessary to strengthen the work for automation of the accounting of the yearly, monthly and long-range shipment plans, the compilation of technical norms for the operational activity, and the planning of shipment routing. It is also important to focus attention on the development of automated systems for operational estimating of the freight and train work for purposes of providing a stable supply of loading resources for the roads and branches. We must bring to a qualitatively higher level the work of the locomotives and the locomotive crews and the preparation and introduction of systems for monitoring the malfunctions and technical status of locomotives on the basis of extensive use of automated pickup of information from the locomotives.

We are completing the development of a standard railroad ASU for the transport process on the basis of an ES [integrated system] of EVM. In 1981 we plan to try it out under operational conditions and in 1982 to introduce it on 13 railroads which possess the necessary technical base. This system is of paramount importance for improving the operational work of the railroads and the use of the rolling stock, stepping up its productivity, and providing for fulfillment of the assigned volumes of transport.

Increased effectiveness of the current ASU is in many respects tied in with improvement of the system for obtaining the requisite information. The present-day organization of the collection and transmission of data from the places of origin to the computation centers can by no means be considered satisfactory. There is duplication of the functions of collection, preparation and transmission of information, which functions are carried out by the service of statistical accounting and reporting on the one hand and the computation centers on the other. It is necessary to as rapidly as possible systematize this activity properly and make provision for the coordination, accuracy, efficiency and operational proficiency of the information function of the transport process.

An important aspect of scientific-technical progress in railroad transport is, as we have noted, the use of microprocessors and micro-EVM which enable us to increase the effectiveness of the automatics and telemechanics devices and systems and the automation of the control of the technological processes and the transmission and processing of the data. We are also able to reduce the cost of the apparatus and to step up the dependability of its functioning. The VUZ's, the transport scientific research organizations, and the design offices of the MPS have begun the work of establishing the appropriate systems based on the microprocessors and the micro-EVM.

There is, however, a need to substantially increase the scope and rates of this work. It is also necessary to establish a technical policy in respect to this work. We are still not doing adequate work to study the areas of expedient application of microprocessor technology in railroad transport. In a number of VUZ's the academic courses and study programs do not include the study of this technology by the future transport specialists. The importance and long-range potential of the use of microprocessors and micro-EVM to increase the effectiveness and quality of the control of the transport process dictate the need to prepare an appropriate special-purpose program and see to its effective implementation.

Increasing the Capacity and Stepping up the Dependability of the Rolling Stock

The rolling stock is, as we know, the most important element of the railroad transport which is directly responsible for the execution of the transport process. The capacity, productivity and dependability of this rolling stock determine to a decisive degree the effectiveness of the work of the railroads. The most complex, expensive and crucial components of the rolling stock are the traction facilities--the locomotives and motorcars.

The widespread introduction on our railroads of the progressive types of traction has produced and is continuing to produce a great economic effect and is an example of efficient use of capital investments which pay for themselves in brief periods. Railroad transport now has at its disposal a fleet of high-powered locomotives.

In the 10th Five-Year Plan deliveries for the alternating current electrified lines consisted mainly of eight-axle freight electric locomotives of the VL80T series with capacity of 6,520 kilowatts and design speed of 10 kilometers per hour, possessing high traction parameters, and equipped with an electric rheostat braking system with automatic control of the braking force. The lines electrified on direct current receive VL10U eight-axle freight electric locomotives with a capacity of 5,360 kilowatts and equipped with regenerative braking devices. We have begun to receive the VL11 electric locomotives, which can be operated in two-, three-, and four-section setups, supplying power of 5,360, 8,040 and 10,720 kilowatts respectively with the capability for pulling heavy trains.

Beginning in 1980 the plants began producing VL80T electric locomotives with revised control circuit setups which enable us to control two coupled locomotives from a single control post. The new electric locomotives were designated the VL80S. They are the basis for the currently being developed variant, which enables us to make up a locomotive from three four-axle sections.

To service passenger traffic on the electrified lines the Czechoslovak plants supplied in the 10th Five-Year Plan six-axle electric locomotives with rheostat braking: the direct current ChS2T with a capacity of 4,620 kilowatts and the alternating current ChS4T with a capacity of 5,100 kilowatts; these locomotives are geared for a maximum speed of 160 kilometers per hour. In recent years we have been receiving eight-axle direct current passenger electric locomotives with a capacity of 8,400 kilowatts; the ChS200 electric locomotives were made for operation with speeds up to 200 kilometers per hour and the ChS6 locomotives up to 160 kilometers per hour.

Extensive research and design work is in progress for the development of essentially new locomotives, including those with noncommutator motors. Already built and being tested are the VL84 alternating current eight-axle freight electric locomotives with rheostat braking. These locomotives provided the first instance of the use of domestic traction electric motors of the frame trestle type for freight vehicles. This design will enable us to reduce the dynamic effects of the electric locomotives on the track and to improve the operation of the traction electric motors. We plan in the future to use the traction electric motors of the frame trestle type on the VL 14 direct current eight-axle freight electric locomotives,

the alternating current 12-axle freight electric locomotives (VL 85) and the direct current ones (VL 15). The new passenger electric locomotives will be made as eight-axle vehicles: the ChS8 for the lines electrified on alternating current and the ChS7 for these on direct current; the capacity of these locomotives is about 7,200 kilowatts and the design speed 180 kilometers per hour.

The fleet of mainline diesel locomotives for freight traffic is being replenished primarily with the 6,000 horse power [h.p.] two-section diesel locomotives, those for passenger traffic with the 3,000 h.p. one-section TEP 60 diesel locomotives, and the fleet of switching locomotives with six-axle 1,350 h.p. diesel locomotive of the ChME3 series and the 1,200 h.p. TEM II. We are continuing the testing of the 4,000 h.p. TEP 70 and the 6,000 h.p. TEP 75 passenger locomotives in a section with design speed of 160 kilometers per hour; also, the 2,000 h.p. eight-axle TEM 7 switching locomotive with alternating and direct current electrical drive.

In the next few years we plan to organize series production of the 8,000 h.p. 2TE121 mainline two-section freight locomotives. In the 11th five-year period we plan to develop a 3,000 h.p. one-section switching locomotive with a coupling weight of 180-200 tons.

Suburban shipments on the electrified lines are provided for by the delivery of direct current motor car electric trains of the ER2 type and alternating current ones like the ER9M. In progress is work for the development of the ER29 and ER30 electric trains with electric braking, improved traction characteristics, and increased spaciousness for providing a higher level of comfort in the passenger lounges.

The design of the locomotives and electric locomotives which are being developed and which are badly needed by transport embraces many progressive technical findings which make it possible to obtain high technical and economic indicators in their operation. It is important that the locomotive builders do this essential work within the established time limits and also that they obtain for the new traction equipment a level of dependability which is sufficient for today's and future requirements.

In the 1981-1985 period railroad transport must obtain more than 3,000 mainline electric locomotives, about 7,900 sections of mainline diesel locomotives, and 2,500 switching and industrial diesel locomotives.

The conditions under which our railroads operate, particularly the great volume of their freight traffic, and the lack of reserves of traffic capacity on a number of lines--these factors make specific demands on the structure of the car inventory, the operating characteristics of the cars, their sturdiness and their operational dependability.

The 10th Five-Year Plan included the implementation of a number of important measures to step up the technical level, reliability and durability of the freight and passenger cars. Thus, the designs of the cars called for the use of copper steel, which made possible a 20-30 percent increase in the corrosion resistance capacity of the units and parts. There was a considerable increase in the use of 10 x NDP steel, the durability of which is 10-15 percent higher and

the corrosion resistance 2-4 times greater than copper steel. We have completed the research work and put into series production the cast parts for the freight car trolleys (the side frames and the spring beams) and the automatic coupling devices made from low-alloy steel); this has enabled us to obtain a 1.5-2-fold increase in the reliability of the operation of these units. We have significantly strengthened the elements of the car bodies and frames and the design of the wheel pairs; we have introduced improved braking devices and axle bearings; and we are using more durable lacquer and paint materials.

All this enabled us in the 1976-1980 period to increase the axle loads of the freight cars from 21.0-21.5 to 22 ts [ton-force] and later to 23.25 ts; also, to increase their freight capacity accordingly. It also became possible to increase the maximum operational speed of the cars to 90-100 kilometers per hour.

In the 10th Five-Year Plan we put into series production covered freight cars of all-metal construction with enlarged door openings which allow for more extensive mechanization of the loading and unloading operations. We have organized production of four-axle all-metal open cars which have increased durability and reliability of the basic units. We have put into series production specialized platforms for the shipment of heavy-freight containers and we have developed eight-axle tank cars for the shipment of gasoline and clear petroleum products, cars with a freight capacity of 120 ts; also, self-unloading cars for bulk shipment of grain, mineral fertilizers and other products.

In the 11th Five-Year Plan the railroads will obtain 390,000 freight cars and more than 15,000 passenger cars. It is planned to develop and start production of 17 new types of freight cars. The most important of these are the general-purpose platform with a length of 19.6 meters and increased freight capacity and space, a general-purpose all-metal covered car with increased body size up to 140-150 cubic meters for the shipment of package piece goods and several kinds of loose products, an eight-axle general-purpose open car with a thick body of 1-T gage, a platform for the shipment of heavy-freight containers with a shock-absorber device of improved design, transporters with a freight capacity of 129, 240, 300 and 340 tons, and refrigerator cars of the "sandwich"type, using aluminum alloys low-alloy steel and polyurethane foam.

It should be noted that we have now to a considerable degree exhausted the possibilities of reducing the weight of the cars and increasing their operational dependability by constructive measures and more efficient distribution of metal in the design elements. Consequently, further reduction of the package weight of the cars is possible mainly as a result of extensive use of stronger steels and light alloys.

The car-building industry has worked out a design and technology for the assembly and welding of car structures from nickel-free, stainless steel. The use of this material makes it possible to reduce the amount of packing materials for a passenger car and to cut down by approximately 3 tons the expenditure of metal for making the car. In addition, it obviates the need to dismantle the interior equipment of the car body when capital repair is carried out.

A number of complex problems pertaining to improvement of the designs of the cars can be resolved by the use of aluminum for their manufacture. The figures indicate that with aluminum there is achieved a considerable reduction of the package weight of the car, an increase of its freight capacity and a reduction of the expenditure of rolled ferrous metals. And, as a whole, a considerable technical and economic effect is obtained. Aluminum alloys, which are one-third as heavy as steel, possess high corrosion resistance. This is very important in the case of cars used for shipping freight which frequently creates a corrosion-aggressive medium. We should also take note of the relative simplicity of obtaining complex closed contours from aluminum with the desired size distribution, the ease of mechanical processing of the metal, etc. All of this leads us to consider the use of aluminum alloys as the future trend in railroad-car building.

One of the important measures for increasing the effectiveness of the operation of the railroads is the conversion of the freight cars to roller bearings. In line with this, we intend in the 11th Five-Year Plan to use MPS manpower and facilities to convert to roller bearings 200,000-250,000 freight cars in the fleet currently in operation.

Further improvement of the passenger cars will be in the form of improvement of their technical and economic indicators, their thermotechnical characteristics and their comfortableness, these in the context of their operation under the conditions of the north and the BAM [Baykal-Amur Mainline]. Planned for the next few years is extensive introduction of electric heating systems. Industry has been tasked with the job of developing and putting in production noncombustible materials for the interior structures of the passenger cars.

Reliable and highly productive operation of the rolling stock is in many respects determined by the level of their technical servicing and, in their repair, the use of progressive technological processes and new materials with improved characteristics. The repair plants of the MPS and the car depots have acquired considerable experience in successful application of the scientific-technical achievements for conditioning the rolling stock.

For the mechanization and automation of the labor-intensive repair processes some MPS plants have installed manipulators--industrial robots. In the 11th Five-Year Plan we have worked out a complex of measures for further use of robots as charging devices for the presses and in welding, painting and other operations.

The repair enterprises have developed new technologies for the processing of piston rings by phosphating instead of tinplating and by hardening of the gear wheels by means of high-frequency currents in semiautomatic machines. They have put in practice dismantling and assembly of the press couplings through use of liquid nitrogen by cooling the encompassed component instead of heating the encompassing one. They have worked out a progressive technology for the final processing of the working surfaces of the tempered teeth of the gear wheels with a tempered tool which increases the labor productivity two-three-fold. They have developed a stand for nondismantling diagnostic work on the bearing assemblies and the drive of the wheel and motor units. They are studying the possibility of using a special enamel for painting the exterior surfaces of the electric locomotives; this enamel will make the metal corrosion-resistant when it is applied in two coats.

In 1981 we plan to introduce a technology for restoring the necks of the wheel pairs by the metallization method; also, plasmic cutting of the metals, gluing of plastic with plywood on a press, etc. To protect the interior surfaces of the passenger cars from corrosion we are investigating the use of a new corrosion-resistant high-viscosity bituminous cement; it can be applied to a phosphated metallic surface without preliminary priming and its probable service life is 18 years.

We are focusing a great deal of attention on the introduction of progressive technological processes and insulating materials in the repair of electric machines. We are developing new technologies for the cleaning of the armatures of the machines in a special unit with trichlorethylene vapors and cleansing solutions of surface-active agents; also, fusing the bus bar tips of the armature coils by welding infusible electrodes in an inert gas medium and applying interturn insulation to the bar tips of the armature coils by spraying insulating varnish in an electrostatic field and by automating the testing of traction motors with the use of EVM.

Work is in progress for hermetic sealing of the armature coils with Elamosil of organic silicon composition and the use of ultrasound for improving the impregnation of the armatures of the electric motors. We are conducting experiments on the use of quick-hardening class F insulating varnish for impregnation. We are investigating the possibility of impregnating the armatures with new materials which do not contain solvents. The advantage of these materials is that when the impregnation is carried out no volatile substances are precipitated and a long term of storage and serviceability is made possible. We plan to develop semi-automatic machines for mechanized application of the frame insulation on the pole coils of the traction motors. We also plan to replace the technological process of compounding with pressing employing self-seating tapes.

In progress is work involving the application of ultrasonic cleaning of the parts of the locomotive diesels and air distributors. In addition, we have introduced a method of testing diesels with regeneration which enables us to return to the network up to 6 percent of all the electric power consumed. We are studying the possibility of using fiber-optical defect finders for examining critical units of the rolling stock and using plasmic curved surfacing in repair; we have made preparations for the introduction of thermal spraying. We are also introducing plasmic cutting of sheet metal and blast cleaning for removal of old paint and rust from the car bodies.

In the repair of the rolling stock and other facilities there is an ever increasing practice of replacing metal with polymers and using aluminum alloys. For example, in 1980 alone the repair plants of the MPS reprocessed 5,600 tons of polymeric materials, of which nearly 1,500 tons were used in rolling stock parts and about 4,000 tons in the upper structure of the track.

The Achievements and Tasks of the Track Organization

The growth of the volume of freight traffic and the increase in the weight of the trains, the axle loads, and the speed of movement have led to an extremely intensive use of the railroad track. This requires the development and introduction of an ever increasing number of improved designs for the upper structure of the

track, the development and extensive use of highly productive repair machines, and the constant improvement of the organization and technology of the work of the railroad personnel.

The increase in capacity of the upper structure of the track is being accomplished mainly by lagging the new types of rails, including thermally treated jointless track, reinforced concrete ties, switches of the heavy types and sloping shapes, conversion of the railroad track to a rubble and asbestos ballast, and reinforcement of the man-made installations.

On the track they are now laying rails primarily of the R65 type and the volume of laying of the R50 type has been cut down. The heavier rails with a weight of 75 kilograms per running meter are being used in the busiest freight shipment sectors. The extent of the main tracks with type R65 rails is about 50 percent of their developed length and thermally treated rails have been laid on 27.7 percent of the main tracks. The average weight of the rails on the main tracks has reached 57.7 kilograms per running meter. However, the gap between the weight per unit of length required for the conditions of operation and the actual average network weight of the rails is still quite large and amounts to 6.7 kilograms per running meter.

The open-hearth steel rails currently supplied to transport are on quite a high technical level and are not inferior in quality to the rails produced in foreign industrially developed countries. The thermal treatment of rails introduced in the metallurgical plants has enabled us to increase their service life 1.5-fold. During the period of the 10th Five-Year Plan thermally treated rails were laid on 31,600 kilometers of railroads.

There has been a constant increase in the volume of work for the laying of jointless track and the proportion of this type of track now constitutes more than 24 percent of the total length. In the 10th Five-Year Plan alone there were 21,800 kilometers of jointless track laid. We have made a widespread practice of reusing serviceable old rails after they have been repaired. Tracks of this kind have been laid for a distance of approximately 25 percent of the developed length of the little used main tracks.

In the track-laying industry there has been extensive use of crossties made from softwood; the service life of these ties averages 16 years. To lengthen the service life of the wooden ties we have organized two-stage use of them with repair at specialized tie-repair enterprises. In ever increasing use are reinforced concrete ties. The total length of the main tracks on reinforced concrete ties now comprises 26 percent of the developed length. The use of reinforced concrete ties is helping to bring about a considerable saving of commercial wood. However, the track with reinforced concrete ties possesses a higher level of rigidity and for this reason cutting down on it is an important task.

Most used on the track with reinforced concrete ties are the KB type rail clamps. Experience has shown that the clamps of this type do not provide the necessary level of resilience of the track and this has an unfavorable effect on its condition, especially on the graded sections of jointless track. It therefore also

requires skilled help from the scientists and engineers. In recent years there has been ever increasing use of adhesive bolt insulating joints which have a service life 2-3 times greater than those with fiber lining; the railroads have established special technological lines for manufacturing them.

The switches produced by the domestic plants are equal to the best world models in technical level. We have developed the type R65 broad 1/11 switch with movable frog core, which meets the long-range operational requirements.

All the chief railroad mainlines have been converted to the improved types of ballast--rubble, graded gravel, and asbestos. The proportion of the main tracks on these types of ballast comprises 84.2 percent in extent. More than 20,000 kilometers of track have been laid on asbestos ballast, which has proved to be desirable in the busy freight congested sectors; the extent of the use of this ballast will be expanded.

The work of repairing the track is the most arduous and labor-intensive job in railroad transport. It entails removal of a large quantity of cumbersome and heavy structures from the track and its packing. The track work is done under difficult operational conditions at a "window" with duration of 4-6 hours. On the basis of full mechanization we are constantly perfecting a progressive technology for the work and implementing it on a broad scale; this technology is giving us a high hourly yield. In the repair of the track we use track-laying cranes, straightening, lining, and finishing machines, rubble cleaning and leveling machines, electric ballasters, and other equipment.

In recent years we have begun production of the new ShchOM-4 rubble cleaning machines for cleaning the rubble on the track with heavy types of rails and reinforced concrete ties; these machines have a productivity of 2,000 cubic meters per hour. We are also producing track-laying cranes for dismantling and lining 25-meter sections with wooden and reinforced concrete crossties; also, the PRSM-3 track power-operated rail welding machines. Many domestic track-repair machines surpass the foreign equipment in productivity. However, the foreign machines, especially those for straightening and stabilizing the track, are characterized by a greater degree of automation of control and regulation, which makes for improved quality of the work. Under the licenses of the firm of Plyasser and Toyrer (Austria) plants of Mintyazhmash [Ministry of Heavy Machinery] have put into production the VPR-1200 and VPRS-500 straightening, lining and leveling machines, and the R-2,000 leveling machines. We have developed a domestic highly productive machine for reinforcing and lubricating the clamp and packing bolts of the rail braces. We are also continuing the work of developing other new improved machines.

Under present-day conditions special importance attaches to the organization of series production of highly productive mechanization of the work of repair and current maintenance of the track. Solution of the problem of fully satisfying the track workers' needs for these machines will enable us to change over to the machine method of current maintenance of the track and to step up the level of mechanization in track repair of all types.

In the track work of the railroads we are using control and measuring facilities--portable and mobile manually-operated cars, track-measuring cars, and defect-finding cars. The existing track-measuring cars operate at speeds up to 100 kilometers per hour and work is in progress to develop devices which can be used for taking measurements on the track at greater speeds. The defect finding facilities used on the roads were made at a fairly high technical level. At the same time, work is being done to further improve the defect-finding cars and the detachable rail defect finders.

In the 11th Five-Year Plan and in the subsequent period it will be necessary to substantially increase the rates of full mechanization of all the types of track maintenance and repair. The basis of this work is the development and introduction of a complex of track machines, stepping up of their hourly productivity and the quality of the operations carried out, and improvement of the organization, and technology of the repair work at the "window."

It is essential at the plants of Mintyazhmash to substantially increase the production of track machines, particularly those for the straightening, lining and finishing cyclical operation, and machines for the packing of ballast, for reinforcement and lubrication of the insertion and clamp bolts, for individual replacement of crossties, and for rail-polishing trains with active operating controls.

Also to be fulfilled is important work for further reinforcement of the upper structure of the track and for bringing the track into full accord with the railroads' current and future operational requirements. The condition of the track will be improved by further increase of the weight, quality and operational stability of the rails, by stepping up the delivery of the new heavy, thermally treated rails, and by expanding the area of the laying of jointless rail structures.

In the 1981-1985 period railroad transport is to receive 11 million tons of new rails--25 percent more than in the 10th Five-Year Plan; more than 80 percent of these are thermally hardened. By the end of the five-year plan the extent of jointless track and reinforced concrete ties will reach 80,000 kilometers. The volume of capital repair of the track will increase by not less than 28 percent. More than half the work will be carried out on lines with a high level of freight traffic, located on roads of the Urals, Siberia and the Far East. Vast resources are being used for the reconditioning of engineering installations. For example, we are allocating nearly twice as much metal as in the 10th Five-Year Plan for replacement of obsolete spans of the bridges.

In the five-year period transport is to receive more than 120 packing cranes, about 300 straightening, lining and leveling machines, the same number of snowplows, and many other pieces of equipment. Effective use of these machines and mechanisms will enable us by 1985 to raise the level of mechanization in capital repair to 87 percent, in medium repair to 76 percent, in travel repair to 68 percent, and in current track maintenance to 40 percent.

Thus, in the 11th Five-Year Plan and the subsequent period we will have to resolve a multitude of the most diverse scientific-technical problems relating to the task of accelerating the development of railroad transport and full satisfaction of

the transport requirements of the national economy and the population. In addition to the subjects reviewed above, the broad scope of these tasks also includes increasing the rates of container and package shipments, full mechanization and automation of the loading and unloading operations, specific problems of technical re-equipping of the metros, problems of environmental protection, etc. Special attention must be focused on the fastest possible introduction of the already completed developments and on the problem of increasing the practical yield from the industry's scientific potential.

A qualitatively new stage of the research being done both in the realm of transport and beyond its limits is the preparation of a long-term comprehensive program of development of transport. This work must be based on a rational distribution of the productive forces in the country and on a scientific forecast pertaining to the development of its economic regions with full regard for the transport factor. It is also extremely important to determine the scientific bases and methodology for the comprehensive development of the traffic and carrying capacity of the various types of transport and to find the basic principles and methods applicable to the distribution of the shipments among these types.

Successful implementation of a program on such a scale and of such extreme complexity requires effective coordination of the research work carried out in the various organizations, expansion of the joint interdepartmental scientific research work, and the development of fundamental and theoretical research. Only the combined vigorous efforts of the transport specialists, the specialists of industry, Gosplan and Gossnab, and the scientists of the USSR Academy of Sciences and the industry sector scientific research organizations can insure the full and most effective solution of the transport problem--a problem which in the context of today's conditions is acquiring paramount national economic and social importance.

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GOSSTROY OFFICIAL NOTES NEED FOR IMPROVED INFRASTRUCTURE IN BAM ZONE

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 13 Nov 81 p 2

[Article by F. Fomin, first deputy chairman of Gosstroy USSR and chairman of Gosgrazhdanstroy [State Committee for Civil Engineering Construction]: "Plant and Home Equivalent Installations--a Permanent Visa for the BAM"]

[Text] The successes achieved in the construction of the Baykal-Amur Mainline [BAM] are well known. The 26th Party Congress assigned the task--to inaugurate in the current five-year plan the movement of trains throughout the length of the line.

The Baykal-Amur Mainline is not just another railroad but the first and the most important stage in the richest but very sparsely inhabited territories. Figuratively speaking, it is the axis which will help to set in motion the enormous potential of the northeastern regions and draw into the national economy turnover the incalculable natural raw material resources of these regions. And this axis is required to be an exceptionally dependable one. But it needs a developed social and domestic infrastructure. It is particularly necessary because of the fact that in most cases the natural conditions there are quite harsh. It is therefore especially important to provide for the greatest possible development of a highly comfortable urban environment--conditions for productive labor and an environment which is attuned to the life and leisure of the people.

Thus, the rates of economic development of the BAM zone--and also the kind of task assigned in the "Basic Directions" adopted by the 26th Party Congress--will in very large measure be determined by the rates of development of an infrastructure. In theory everyone recognizes this. But in practice some depart from the planned procedure. This is also something that troubled the participants in the third scientific and practical conference on the problems of economic operation of the BAM zone, a conference which took place this fall in Alma-Ata.

The principles underlying the formation of the social and domestic infrastructure are delineated in the general system of regional planning for the zone of BAM impact, in the regional planning projects of the individual oblasts and territorial production complexes, and in the general plans of the cities and settlements.

In the main the city construction suggestions and plans are being observed in the practical work. There are some examples of good complex construction of settlements.

The volumes of residential housing construction are increasing. For the BAM zone we have prepared more than 160 plans of dwelling houses and block sections, which plans take into account the various construction conditions.

However, the set of plans in use is still inadequate. There is very little construction of buildings with few stories, buildings which must fully meet the local requirements. The volume and design planning decisions are not always sound. These difficulties are exacerbated by the deficiencies in the construction itself. Very often the plans for putting cultural and personal service installations into operation are not fulfilled. There are frequent violations of technology and the buildings are often put into service without the public welfare amenities.

A serious flaw which has developed in the work is the construction of a large number of temporary settlements which entail the expenditure of considerable assets. At the same time, the construction management groups of the BAM and the Glavbamstroy [Main Administration of BAM Construction] are not giving the proper attention to the erection of permanent housing and cultural and personal service buildings and they are violating the principles for over-all construction and superior development of engineering networks and structures.

As an example of a narrow bureaucratic and short-sighted approach to the solution of the problem we can cite the settlements of Kuvykta, Zolotinka, Ust'-Nyukzha and a number of others, where the level of public welfare and domestic service conveniences is very low. Even in Tynda, which is called the capital of the BAM, there is not enough housing and there is a lot of foot-dragging in the construction of public buildings, modern hotels, and public dining and personal service enterprises. We are falling behind in the development of an agricultural base to provide vegetables, milk and other products for the city population. Many of the trade enterprises are located in so-called "adapted premises," that is, again essentially temporary ones.

In effect the MPS [Ministry of Railways] and other customers are now injecting in the plans the lag in the development of the production sphere. As a result, the rates of housing construction and cultural and personal service construction are much lower than the rates of population growth. Thus, the amount of living space available per person is in some settlements only 1/2-1/3 of the norm. This shortage is an extremely painful one in the cultural and personal service enterprises and even more so in the children's preschool institutions. The BAM is a young people's construction project and there are of course many children there. Only one-third of them can attend kindergarten. What happens is that two-thirds of the number of women who possess construction and other skills that are needed here are compelled to stay home.

We thus today see coming to the fore with crucial intensity the question of systematic implementation of the scientifically validated concept of city construction development of an enormous zone and the formation of its social and domestic infrastructure, with elements which answer the special requirements of the region and its significance in the program for the country's economic development. For the development of this infrastructure we are today expending one-sixth of all the rubles invested in the development of the BAM zone. It is now time to change this proportion. The figures indicate that it is now necessary to invest twice as many rubles, that is, one-third of the total in order to achieve a balance with the

rates of development of the production and social sectors and to accomplish this with minimum losses.

However, both in the MPS and the Mintransstroy [Ministry of Transport Construction] and also in the Union Minenergo [Ministry of Power] and the other ministries and departments whose interests are affected by this the problems of the development of an infrastructure are judged from sectorial points of view. Also, come what may, the production tasks become predominant and the thoughts concerning the rear organizations remain just thoughts.

Isn't this why we are getting such slow development of this area's system of construction industry enterprises--the basis of stepped-up rates of city construction? At station Chimanovskaya they have not fully developed the planned capacities of the large-panel house construction shop and in Tayshet the Mintransstroy large-panel house construction plant is maintaining slow rates of construction. And in the BAM settlement the subdivisions of this ministry have in two years used scarcely one-tenth of the estimated cost of the installations of the brick plant, which is supposed to supply 60 million bricks a year. In the meantime the construction people are getting from the local enterprises less than one-third of the precast concrete and wall and nonmetallic materials. The rest is being transported over great distances and bought at exorbitant prices.

Even a pencil estimate indicates that in the next 10 years the capacities of the contract organizations concentrated in the BAM zone will experience considerable growth. There will also be a corresponding increase in their need for the basic building materials and structures. Should everything still be brought in from the outside? This is hardly economically sound.

Mintransstroy and Minstroymaterialov [Ministry of Construction Materials] USSR and in particular Minvostokstroy [Ministry of the Construction Industry of the Eastern Regions] must step up considerably their efforts along these lines and they must work out and implement large-scale measures for the development of their production base. The requisite figures are available--they were reported at the conference in Ulan-Ude. Now it is a matter of bringing them to fulfillment.

In addition to the ministries mentioned, participation in the development of the industrial construction base must also be undertaken by the ministries which are faced with the task of developing the natural wealth of this region.

We recall the following text of the "Basic Directions": "To develop the work for economic exploitation of the zone which encompasses the Baykal-Amur Railroad Mainline. To complete the planning work for the Udokan copper deposit. To continue the formation of the Southern Yakutsk territorial production complex and to complete the construction of the coal-mining pit, the concentration plant and the first section of the Neryungri GRES.

We already know what groups will be formed after the Southern Yakutsk but also virtually in the process of development in the form of planning projects are the Verkhne-Lensk, Severo-Baykal, Zapadno-Amur, Zeyskiy, Selemdzhinskiy and Komsomol'skiy territorial production complexes and the Udokanskiy and Urgal'skiy industrial centers.

The implementation of this magnificent program requires enormous labor and material resources. With this scope it is necessary to concentrate the assets first and foremost for a superior development of the social and domestic infrastructure. The establishment of this infrastructure is a basis for holding the personnel. And in this instance personnel is the decisive requirement for fulfillment of the task in its entirety.

The means, like the responsibility for the over-all development, must be concentrated in the hands of the general builders. It is today possible to determine who they are for each territorial production complex and industrial center. Let us say in southern Yakutiya the largest volumes of capital investments are those of the Minugleprom [Ministry of Coal Industry] USSR. This ministry must also be responsible for the development of the complex as a whole and consequently also for the establishment of a well-planned habitable environment. There will thus be no decrease in the contractor's motivation for maximum development of the base of the construction industry. In Udokan the Mintsvetmet [Ministry of Nonferrous Metallurgy] USSR can become a general builder and in the Verkhne-Lensk, Zapadno-Amur, Selemdzhinskiy and Zeyskiy complexes the Union Ministry of Timber, Cellulose-Paper and Woodworking Industry.

To coordinate the operations of all the concerned ministries and local organs and to exercise control over the progress of BAM zone construction and development it apprently makes sense to organize a special interdepartmental territorial commission under Gosplan USSR similar to the organ set up to increase the effectiveness of the management of the development of the West Siberian fuel and energy complex.

On the surface it may appear that all these questions have no direct bearing on the problems of city construction. But there is a direct relationship. Unless we have resolved the organizational, administrative and supply problems we simply cannot effectively and rapidly build the new, well-planned cities which should become control points for a broad economic development of the territory.

We are again and again reminded of Comrade L. I. Brezhnev's words in the CPSU CC's accountability report to the 26th Party Congress: "The individual most often leaves Siberia not because the climate does not suit him or his earnings are poor but because it is more difficult to obtain housing there and to get his child into kindergarten and because there are few cultural centers. This is why we plan in the current five-year plan to achieve still higher rates in these regions for the construction of housing a. the entire social and cultural complex."

This is a party directive and we must be guided by it in making up our plans and conducting our practical affairs.

7962
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OFFICIAL DISCUSSES METRO EXPANSION PLANS

Moscow GUDOK in Russian 1 Nov 81 p 1

[Interview with B. A. Shelkov, deputy minister and chief or the Main Administration of Metros: "The Metro Steps into Tomorrow"]

[Text] At the Ministry of Railways a press conference was held with Deputy Minister B. A. Shelkov, chief of the Main Administration of Metros.

[Question] Boris Alekseyevich, what is the outlook for the near future with respect to the development of the country's metros? What will be done during the years of the 11th Five-Year Plan?

[Answer] In accordance with the decisions of the 26th Party Congress and the assignments of the five-year plan and in accordance with the long-range comprehensive program, the present-day development of this sector will proceed at rapid rates. By 1985 alone 112 kilometers of track for the underground lines will be turned over for operation. The length of all the lines will comprise 454 kilometers. We have new equipment which will enable us to make extensive use of this high-speed travel.

Eleven large cities in the country will use the services of the "underground," which will daily transport 11 million passengers. In 1984 the inhabitants of Minsk will obtain the first section of a line which consists of eight underground stations. A year later the metro will appear in Gor'kiy. Construction of this most convenient municipal transport will continue in Dnepropetrovsk, Novosibirsk, Kuybyshev and Sverdlovsk. Nearing completion is the planning documentation work for metros in Riga, Omsk, Alma-Ata, Perm', Rostov-on-Don and Chelyabinsk.

Four billion rubles--such as the value of the fixed production capital of the "metro industry" in the current five-year plan. More than 20 enterprises of the MPS [Ministry of Railways] are doing work for the sector. Among them are the Mytishchi Machine-Building Plant, the Leningrad Railroad Car-Building Plant imeni Yegorov, and the production association Dinamo.

[Question] The Moscow metro imeni V. I. Lenin is the country's largest. The metro accounts for nearly 50 percent of the passengers of city transport and the flow of these is increasing steadily every year.

[Answer] In the period of the five-year plan the Moscow metro will experience a growth of 30 additional kilometers. The lines will link the areas of new buildings on the outskirts of the city with the center of the city and the chief transfer junctions will be enlarged. The construction of two radiuses--the Serpukhov and the Zamoskvovretskiy, the stations at the Savelovskiy terminal, and the extension of the Kaluga-Riga line will enable us to relieve a considerable portion of the surface transport load and to improve the passenger service capabilities. It should be noted that along with the construction of new lines, the metro builders are renovating and rebuilding the existing lines, especially the prewar ones.

[Question] We know that at the peak hour the volume of passenger flow increases sharply. Can the traffic capacity of the Moscow metro be increased?

[Answer] We have perhaps already found the optimum variant: 42-45 trains an hour. It is not possible to decrease the traffic interval but by 1985 the capital metro will obtain an adjustment batch of type I cars, which are improved and more spacious. They will be used on the circumferential line--the liveliest and busiest one.

The Moscow Institute of Railroad Transport Engineers has worked out a system of interval control of the movement of trains with intratunnel equipment brought to the station. This work will undoubtedly produce a great economic effect. The Zhdanovskiy-Krasnopresnenskiy and the Kalininskiy lines have been converted to the new system of operation of trains by one engineer without an assistant.

[Question] Has the noise problem been solved?

[Answer] Yes, a long time ago. In the sector of the line running through the shallow foundation of the Botanical Garden--Sviblovo we installed noise and vibration prevention devices and the rails rest on rubber shock absorbers. On many of the runs we have installed crosstie rubber packing of increased resilience which significantly decreases the level of noise and vibration. The lines opened up are located in residential zones no closer than 40 meters to the homes.

7962
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FINNISH PRESS: FINNISH PLANTS TO MAKE RAIL CARS IN JOINT PROJECT

Helsinki HELSINGIN SANOMAT in Finnish 7 Jan 82 p 27

[Article by Pentti Suominen: "Railroad Car Production to Commence in 1985"]

[Text] Moscow--Next fall the Rautaruukki Company will begin construction on a specialized railroad car plant in cooperation with the Soviets in Otamaki and Mustavaara wnere the expected halt to mining operations will leave approximately 1000 people unemployed.

Managing Director Helge Haavisto, who has been participating in a 2-day meeting of the Finnish-Soviet Economic Commission, talked about this project in Moscow on Wednesday.

Haavisto stated that the Soviets had given their approval of the project in principle during the negotiations and he estimated that the first cars from the new plants will be produced at the end of 1984 or in the beginning of the following year.

He stated that past experience in trade with the Soviet Union has indicated that a decision in principle usually means that a project will be accomplished.

"After this it is a normal question of trade, which is pushed forward," stated Haavisto.

3,000--4,000 Railroad Cars

The intent is to export 3,000--4,000 specialized railroad cars to the Soviet Union annually, for example, for the purpose of transporting ore, coke, motor vehicles, and grain.

Haavisto stated that Foreign Trade Minister Nikolay Patolichev, the chairman of the Soviet delegation to the economic commission, who made the announcement on the Soviet decision in principle, considered the planned annual production to be an absolute minimum and would be ready to purchase even more railroad cars.

The Soviet Union, which is experiencing a continuing shortage of railroad cars, is striving to procure 70,000 new railroad cars annually by the middle of this decade according to the new five-year plan.

Haavisto stated that the construction of the railroad car plants in Finland will have no effect at all on the plans to build a railroad car repair depot with Finnish labor in the vicinity of Leningrad.

"The only thing that these two projects have in common is the words railroad car," he stated.

Discussions Unofficial

Bank Director Ahti Karjalainen, the chairman of the Finnish delegation to the commission, described the discussions of the economic commission's delegations as unofficial at a press conference on Wednesday since not all the members of the commission were present.

He stated that continued discussions on certain unresolved issues was confirmed as necessary in connection with the meeeting of the economic commission held in Helsinki at the end of last year.

The central subjects of discussion were certain joint projects in Finland and the Soviet Union, and Karjalainen stated that it is especially important to find means for increasing Soviet imports for future trade development.

In addition to the building of specialized railroad cars, another joint venture close to being realized is the exploitation of Soviet forests in the vicinity of the Finnish border by means of Finnish labor and Finnish machinery.

Timber Cutting in Karelia

Minister Olavi J. Mattila stated that the intent is to conduct on-site studies this spring on the possibility of thinning out forests in Karelia.

He estimated that if this plan succeeds, it will employ 400--800 Finns and would increase lumber imports from the Soviet Union.

Managing Director Tankmar Horn of Wartsila stated that the technical negotiations concerning a nuclear powered icebreaker, which will be built as a joint Finnish-Soviet project, will continue during the current year and it is expected that trade negotiations on this matter will commence next year.

According to him the intent is to reach an initial agreement on the construction of one or two icebreakers. The ships themselves will be built at Wartsila's Helsinki Shipyard and the atomic reactors will be built in the Soviet Union.

The ships will be designed for the needs of the delta areas of the relatively shallow waters of Siberian rivers.

Port Contract Will Not Be Divided

Managing Director Kauko Rastas of the Polar Costruction Company stated that the expansion work on the Port of Tallinn being planned will perhaps begin in 1983--1984.

Karjalainen stated that the Finns made it clear during the negotiations that the port contract would not be parcelled out, but that the Finns should retain the largest possible share.

In talking about increasing Soviet imports he stated that the intent is to send purchasing delegations from various areas to the Soviet Union to study import opportunities.

"The finding of additional imports will not be easy, but it will become a central issue in the near future since without imports there can be no exports," stated Karjalainen.

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METHOD OF IMPROVING CAR USE DISCUSSED AT NOVOSIBIRSK CONFERENCE

Moscow GUDOK in Russian 21 Nov 81 p 3

[Article by GUDOK correspondents V. Kurkov and V. Sbitnev, Novosibirsk: "The L'vov Experience at the Service of the Five-Year Plan--What is at the Basis of the KSEIV [Comprehensive System for the Effective Use of Railroad Cars]--Notes from the All-Union Seminar Conference in Novosibirsk"]

[Text] It now appears that everything is known about the L'vov comprehensive system for effective use of railroad cars (KSEIV). It may be supposed that two All-Union seminar conferences--in L'vov and Novosibirsk--delineated all the points under this topic. It is, as they say, a matter of introduction, particularly since on the basis of its KSEIV it does not appear to be complicated. L'vov party obkom secretary V. A. Svyatotskiy, speaking in Novosibirsk, said that this system consists altogether of three basic elements. The first is the effective lever for regulating the interrelationships between the railroads and the enterprises which use the railroad cars. The second is the new normative base, the improved criteria for evaluating the work, and the standards. The third is the material and technical base of the transport shops of the enterprises.

An effective lever, of course, is the car-hour. This leaves no room for doubt--everything is clear. Although this lever will have genuine clout in all areas only after appropriate changes are made in the bylaws of the USSR railroads. Also, no one objects to such a reservation--it is a matter of time. This question is already being resolved. Everything is also clear with respect to the normative basis. Those who are efficient and concerned in their approach to the task of studying the L'vov experience and incorporating it in their own programs have already begun to examine both the common technological processes and the contracts for over-all competition and to work out the relevant local norm characteristics. And it is especially important to discuss what the third lever consists of.

Let us put this question to ourselves: Why did it take five years in L'vov to prepare for the activation of the KSEIV? Yes, we know the reason now. There was a difficult psychological restructuring and there were difficulties also in developing the technological processes, norms and standards. But time was needed first of all to develop and rebuild the approach tracks, to acquire modern locomotives and loading and unloading equipment, to enlarge the warehouses and the loading fronts, etc. At the same time, the technology was improved, the interrelationships among the partners were reviewed, and new forms of competition were developed.

Here, for example, is an extract from the information leaflet of the L'vov obkom of the Communist Party of the Ukraine:

"Until 1975 the transport organization of the bus plant was the greatest 'bottleneck.' The people worked on one shift, manual labor predominated in all the operations, the track function was poorly developed, they did not have their own locomotives or a front for unloading many products, etc." And the leaflet goes on to describe the natural result: "The plant paid substantial fines to the railroad for excessive layover of cars."

The leaflet then tells what was done during these years and what result this achieved. In the 10th Five-Year Plan the car turnover was tripled. Every year sees a reduction in the cars' layover time for freight operations and there is no talk whatsoever about fines. On the contrary, in the last four years the transport people achieved a savings of 34 trains.

And to preclude any doubt as to what is most significant in the L'vov accomplishments, this is underscored in the information leaflet. In particular it emphasizes the following. "The system is based on good preparation of production and a strong material and technical base."

We have dwelt in detail on this one example, not because it is something exceptional. On the contrary, it is typical. At the seminar conference in Novosibirsk quite a number of such examples were cited with different variations. And we are not making a discovery when we assert that neglect in the construction or development of a railroad invariably leads to losses of loading resources and, as a consequence, to disruptions in the supply of transport for production.

Unfortunately, this attitude has undergone almost no change over the years. Not long ago we discussed the transport disproportions in the construction of the Kansk-Achinsk fuel and energy complex (KATEK). An astonishing consistency! It is as if the Gor'kiy experience did not teach anything to anyone. But all the same, sooner or later life compells us to correct these errors, to put it mildly. With respect to the L'vov system, to be sure, and in the KATEK. Only one must not harbor any illusions that the breakthrough can generate only some organizational measures, even if the most effective ones. The transport and warehousing facilities must develop in synchronization with the basic production and even go beyond it.

At the seminar conference Deputy Minister of Railways V. N. Gin'ko cited the following figures. In the last five-year plan more than 7 million cars were irretrievably lost because of excessive layovers on the approach tracks. The enterprises paid about one billion rubles in fines. This money would have been used for strengthening the transport organization!

The deputy director of the VNIIZhT [All-Union Scientific Research Institute of Railroad Transportation], Doctor of Technical Sciences N. A. Vorob'yev, said that in 1980 alone 12 ministries and departments were supposed to but failed to develop 325

statiions, failed to build 650 approach tracks, failed to lay 350 tracks at their own technological stations, failed to put into operation 16 car dumpers, and failed to build 27 unloading platforms and 46 railway warehouses. And this in just one year!

In L'vov a great deal was achieved because of the initiative and persistence shown by the party organs. A goodly number of forms and methods of exercising party influence were described at the conference. We will not enumerate them. It is a subject for a special talk. In each specific case there is usually mention of the task itself and the methods of accomplishing it. We would like at this point to emphasize the position taken by the party organizations in L'vov. V. A. Svyatotskiy, L'vov party obkom secretary, said that if the obkom, the city and rayon party committees, and the party committees of the enterprises and railroad centers had not taken this matter into their own hands, it can safely be said that there would have been no talk about the L'vov system.

And how important the party, and that means the nondepartmental supervision of the matter, is can be judged from the situation in the Kuzbas. There the introduction of the KSEIV and the use of its basic lever--the car-hour--surely require additional research and a decisive party policy. The cars there, of which there are enormous quantities are in need of miners. As a rule they do not wait beyond the normative time for unloading of coal. And the losses occur at enterprises of other departments. They are especially large at two Novokuznetsk metallurgical giants--the KMK [Kuznetsk Metallurgical Combine] and the Zapsib metallurgical combine. They unload more metallurgical products than they ship. There is no interest in additional cars for them. They take as many as they like from their unloading.

The seminar conference shed a perhaps not complete but a clear light on one other problem which must be resolved if the L'vov experience is to be disseminated. This problem pertains to the PPZhT--enterprises of industrial railroad transport--and to their role in resolving the transport problems. L'vov does not have such subdivisions and hence the formation of the KSEIV took place without regard for the characteristics which have been introduced in the relationships between the stations and the industrial enterprises by the intersectorial forms of maintenance of the approach tracks. These characteristics are indeed present. One does not suppress them or bypass them in preparing the methodological and regulatory documents.

West Siberian Railroad deputy chief V. B. Nikolayev related how several junctions of the railroad were successfully operating six PPZhT's. They service 258 industrial enterprises. Having proved their worth on the approach tracks the PPZhT's began in fairly rapid fashion to develop their own material and technical base. Now many of them represent highly mechanized subdivisions, well provided with modern equipment and well staffed with skilled personnel. After spending 14 million rubles during the last five-year plan for the strengthening of the base, they obtained a very substantial yield. For example, in the last two years the Barnaul PPZhT reduced the layover of cars by one hour.

One thing, as has been said, is clear: when there is a dependable foundation it is easier to institute both a calendar loading plan and daily schedules for the

transport of local freight; also, to develop the technology, develop intersectorial competition, etc.

Convincing evidence of this is also furnished by the work of the Krasnoyarsk industrial railroad transport association Promzheldortrans. In five years the fixed capital of the PPZhT has nearly tripled. They are enlarging the loading and unloading fronts, mechanizing the labor-intensive processes, and creating favorable conditions for highly productive labor. In other words, the subdivisions of the Krasnoyarsk Promzheldortrans association are right on course for the establishment of a foundation which will enable them to both improve their own work and to rapidly introduce the achievements of other collectives.

Emphasis should also be placed on other important features of the PPZhT. Whereas for the industrial enterprises the transport problems, we will say straight out, are not the most important ones, for the PPZhT they are the basis of all the activity and they constitute the production itself. This was well presented in the talk given by M. G. Chizhov, the chief of Novosibirsk PPZhT No 1. In five years, they spent 4.5 million rubles for the development and strengthening of the material and technical base. They were able to more than double the volume of shipments of freight and to increase five-fold the volume of loading and unloading work. The labor productivity was more than doubled and the layover of railroad cars was reduced by more than two hours.

Thus, the establishment of the PPZhT's once again showed in convincing fashion that the centralization of capital investments, including those for the development of the transport capability, ultimately produce a substantial effect.

But for the development of the conventional approach tracks the funds are expended by the pertinent departments which in the PPZhT's all the work is financed by the MPS [Ministry of Railways]. The money, as it turns out, comes from various sources. However, in principle it is state money. And it is not a question of how this money is distributed. It seems that this question can be resolved. More important is another consideration--in the subdivisions of the PPZhT the funds are expended more rationally. And there the rates of putting capacities into operation are higher and the technical progress more purposeful. In addition, there is a considerably smaller work force and better use is made of the locomotives and the loading and unloading equipment. In other words, the transport servicing of the national economy enterprises is carried out at considerably less cost to the state.

The social aspect of the matter is also worth emphasizing. The worker of the transport shop in an industrial enterprise is far from being a dominant figure. The PPZhT worker, on the other hand, is a compiler of trains, a machine operator, a railroad engineer, a dispatcher, and, as he is in railroad transport, a worker of a leading vocation. This means that skilled people are more willing to come here.

All this is precisely what makes natural and understandable the fact that the overwhelming majority of the PPZhT's not only keep within the assigned norms for layover of railroad cars but also effect a considerable savings of loading resources. And the L'vov people themselves believe that in some cases it will be desirable for them too to establish subdivisions of industrial railroad transport. It is also, of course, necessary to make adjustments in the KSEIV.

The application of the L'vov experience in the industrial railroad transport enterprises requires the solution of many problems. A considerable number of questions came before the presidium of the seminar conference. In this regard Deputy Minister of Railways V. N. Gin'ko said there were no solutions ready at this point. All the questions will be given careful study and they will be taken into consideration in the preparation of recommendations and normative documents.

Thus, the principle of the KSEIV is well known. A beginning has been made for the introduction of this system, which is highly prized by the CPSU Central Committee. The details and the variants to allow for local characteristics must be worked out while the introduction is in progress. And this is a matter which indisputably deserves first-priority attention. And the first steps along this path are encouraging. The expanded search for reserves on the basis of the L'vov endeavors will surely open up new potentialities for improving the national economy's transport service.

7962
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UPGRADED PLANT FALLS SHORT OF GOALS

Moscow GUDOK in Russian 17 Nov 81 p 2

[Article by GUDOK special correspondents A. Sokolov and V. Chistov, Orenburg: "A Charge of Negligence--Unused Capacities"]

> [Text] The sum of 12 million rubles has been expended for the remodeling of the Orenburg TRZ [Diesel Locomotive Repair Plant] but the planned level of output production has not been attained.

Everyone can obtain a general idea about the Orenburg Diesel Locomotive Repair Plant from the photographs which hang on the walls of the residential microrayon. In these photographs the new buildings of the diesel locomotive assembly shop, the electric machine shop, and the diesel, trolley and the other shops look impressive and attractive. The figures tell an eloquent story about tomorrow: the capacities of the plant are geared for the reconditioning of 600 diesel locomotive sections a year and it is planned to produce 3,600 traction motors.

Later we more than once saw stands like these in the city alongside of advertisements inviting to the plant people of the most diverse specialities: fitters, electricians, machine operators, foundry workers.... And it was felt that the personnel is sufficiently concerned about what needs to be done.

"We are indeed sufficiently concerned," declared G. Yelizarov, an engineer for personnel training. "For remodeling of the plant we need to get about 2,000 more people and to train the former locomotive workers for new jobs. We not only have been failing to replenish our staff but we have even been losing our specialists. More than 600 labor veterans have left the plant of their own volition. And it has turned out that the new buildings have been built but there is no one to work in them.

We regarded Yelizarov's words with suspicion; he is exaggerating, we thought, trying to find a justification for the fact that the collective had for a long time now been unable to fulfill the state plan for both volume and assortment of output produced. And after all, 12.5 million rubles had been expended for production retooling. And with respect to its production capacities the Orenburg Diesel Locomotive Repair Plant is today one of the largest in the network of plants specializing in repair of diesel locomotives.

But a tour of the basic shops convinced us that the manpower situation is an alarming one. In the enormous electric machine shop building with an area of 12,000 square meters one can lose one's way and not meet a single person.

"Fulfillment of the production program," said the deputy chief of the plant for electric machine production, "requires not less than 800 people, 1,700 if we take into account the outlook for development, and the work force of the shop does not even have 60. It's true that every one of them is truly a magician. With actually no equipment our fitters nevertheless manage to repair the traction motors."

It's true he made no mention of the fact that for three years the collective of the electric machine shop has been bogged down in one place: from 1978 on they have invariably planned production of 500 traction motors. But it does not achieve even this objective. And it is customary to allow not more than two years for putting the planned capacity into operation. The shop collective does have an excuse: only in a conditional sense can 1978 be designated as the year for putting the electric machine production into operation. The shop was still without a roof when the main administration released the plan for repair--500 traction motors.

A rather acute situation has also developed in other shops. For example, the new diesel locomotive building went into operation eight years ago but this year they plan to repair only 226 locomotives in it. No one even mentions a yield in keeping with the planned capacity. In the trolley shop labor productivity has not increased even one percent in the last six years. In the wheel shop output production not only has not increased but has even declined. In the diesel shop they have barely begun to repair the 2D100 diesels: but they still hope to make delivery for the cooperative. And after all, it long ago was time to roll up their sleeves and get under way in production of both diesels and motors.

And it is essential to roll up one's sleeves in the direct sense of this word: not mechanization at all! In any shop, in any of the sectors you do not just stay for a while--the crowbar and the hammer are the basic tools used by the fitters both in repair of a mechanical component of the diesel locomotives and in reconditioning other units, including electric machines.

The executives of the plant have not been able to explain why they have in past years not been able to organize an experimental shop or at least a sector. And meanwhile over the years new buildings were erected and they could have gradually started making technological equipment. Now they have to make it on a rush basis. And the haste generates defective goods. In the trolley shop, for example, they installed a flow and conveyor line but it hasn't moved. The same thing happened in the case of the wash machine for cleaning the trolleys.

We went through the shops and constantly asked ourselves the question: why has the plant administration assumed an attitude of indifference in respect to such negligence? You see, in a number of transport enterprises they are literally being strangled by the deficiencies of the production areas. In Orenburg only 40 percent of the additional capacities introduced are in operation. Expensive equipment on hand is idle and without work for days and months. The coefficient of use of this equipment is the lowest in the industry.

The remodeling of an enterprise has as its objective not only and not so much to restore production as to develop a large modern industrial base for reconditioning mainline diesel locomotives. But there is no output: the capacities introduced are idle. What occurred, where did it happen and who is responsible for the errors?

This serious disruption did not happen today and not all of a sudden. The Orenburg plant has been in a fever about this for a long time now and for 10 years the collective has from year to year failed to fulfill the state plan. But the executives of the enterprise and the plant administration, instead of looking for ways to correct the situation, have for a long time been in conflict with the construction people of the Orenburgtransstroy [Orenburg Transport Construction Trust], who have behaved irresponsibly in the matter of remodeling of the enterprise. For the remodeling of the diesel locomotive repair plant they set a unique record: they took 18 years to build the production buildings.

In this length of time even the most improved plan can become obsolete. And as a matter of fact this is what happened. While the remodeling was going on, the plant collective had to set up repair of five series of diesel locomotives. It had to do this with actually no spaces and no technological equipment. For a year or two or three we can accept difficulties like these and the endless construction confusion--in remodeling these things are unavoidable. But when there seems to be no end to it?

And the people have begun to leave. But not just for this reason. It is happening more where the blame attaches to the enterprise supervisors and the main administration, who are also responsible for not a few miscalculations; the consequences of these have been felt even up to the present.

When a plant revises its structure, the production leaders are invariably faced with the problem of how to motivate the personnel for the task of getting the new output into production. The farsighted chief must always give thought to tomorrow. In Daugavpils or, let's say, in Michurinsk they do not expect the new shops to go into operation as yet but in the old locomotive shops they have begun to familiarize the people with repair of diesel locomotives and to retrain them for it. And as a result when they converted to the production they suffered practically no losses of personnel. Also, in Michurinsk, for example, the planned capacities were put in operation two years ahead of schedule. And they were able in painless fashion to overcome all the difficulties associated with retooling.

In Orenburg for some reason they did not consider it necessary to make use of the experience of their colleagues. The plan for repair of locomotives has been cut down from year to year, the shift to production of the new output has been beset with delays, and many of the locomotives have not been satisfactory. And it was in this transitional period that they released (released!) about 800 key workers from the plant. When the collective did finally fully convert to repair of the diesel locomotives it proved unable to make up for this loss.

There was still just one solution--recruit new workers. But this required providing housing, at least dormitory facilities. But beginning in 1969 the main

administration stopped allotting funds to the plant for the construction of housing: in 11 years only one 70-apartment house was put in operation.

Because of the lack of housing, the enterprise also did not retain the graduates of GPTU [state vocational and technical schools] and every year the plant gets 150 young people who acquired their specialty in a base school. For the same reason the Orenburg people have been forced to turn down graduates of the transport institutes. So there has arisen a personnel problem which has become more and more acute from year to year.

In a situation like this you will not be fussy. At the plant they have been glad to hire anyone who expresses consent. And more often the people who come to the plant are odd-job, vagrant types who are glad to be here where they overlook any shortcomings. The official data alone indicates that last year 3,000 man-hours were lost because of drunkenness.

Plant chief S. Yeremenko and chief engineer M. Struzberg are in agreement in enumerating the errors of their predecessors and they give detailed descriptions of the consequences of these errors: during the period of the remodeling the enterprises had three changes of management. And what did they themselves do to remedy the situation in the past two-three years? The next review shows that not much at all was done. The impression was given that when they encountered difficulties they were discombobulated and let things drift.

In this period the plant was visited by many checking and adjusting commissions made up of experienced specialists of the main administration. They filled up a whole portfolio of documents and recommendations--sensible and concrete ones. But one would like to add something to them.

This year in Orenburg they finally undertook the construction of the housing. For next year too it will be necessary to allot more funds for this purpose. Otherwise it will not be possible for them to find any quick solution for the personnel problem.

It behooves us, without waiting for tomorrow, to take all possible measures to provide a full personnel complement for the experimental shop. And for the present all possible assistance in equipping the Orenburg plant could be rendered by the related enterprises.

This year the main administration assigned to the collective of the electric machine shop the task of putting in production five new types of output. But after all, it knew beforehand that they could not handle such a burden. Doesn't this mean that the planning must take into account what the status of the shop is and not give it an unreasonable assignment?

In short, these are problems which are still in need of solution. And the fact that the commissions have worked them out on paper has little meaning. It is necessary to provide effective aid so that the new capacities for the repair of locomotives will be put into full operation as rapidly as possible.

7962
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EXPRESS TRAINS WITH MAGNETIC SUSPENSION

Moscow KRASNAYA ZVEZDA in Russian 15 Jan 82 p 4

[Article by V. Khrustov, KRASNAYA ZVEZDA correspondent, with photographs by S. Nazar'yants: "On a Magnetic Wave"]

> [Excerpt] I have heard that projects are underway in our country for the creation of transportation by electromagnetic suspension. What will this express train be like and what are its special features and advantages in comparison with the usual means of conveyance?
>
> -- Captain M. Somov

Before, I would have expected the answer [to the question of how to solve urban transportation problems] to be, "A subway!" Of course, this modern type of city transportation takes care of the basic burden of passenger conveyance. We are used to its speed, comfort, striking carrying capacity and, finally, its stability, if that is the way to express it. But underground transportation has a substantial drawback: high capital expenditures (a kilometer of line costs 10 to 15 million rubles and, under complicated geological conditions, up to 20 million rubles and even more). Moreover, a subway is profitable only in cities of a million or more people.

Well, what if the population of a city is 600,000 to 800,000 people? The usual ground transportation -- bus, trolley bus, and streetcar -- is already unable to cope with the intensive passenger flow, and the subway is economically unfeasible. The same problem exists in new subregions of the large cities, where the subway has not yet come. What is the solution?

An associate of the "Transprogress" All-Union Scientific-Research and Design Institute responds as follows: there is a need for "flying" trains or transportation on electromagnetic suspension. It is a question of rapid, ecologically clean, noiseless, and relatively inexpensive transportation with significant carrying capacity.

The first problem that developers had to solve was how to get away from the traditional wheel. How could progressive movement be provided without the usual drive links and transmissions?

The answer was found in magnetic suspension of the moving structure, and a linear electric motor. This technical solution -- the car is held in suspension by an

electromagnetic field -- allows high speed and noiseless movement. The first tests of an "undercarriage" were begun at the institute's testing grounds near Moscow, at Ramenskoye. According to the developers' plan, five bogie trucks, coupled together, make up the undercarriage of the future car. This flexibility is necessary so that the electromagnetic express train can travel quietly over the curves in the line. These trains will speed along on special trestles 5 to 7 meters high, laid, for example, along median strips of boulevards and highways. The isolation of the pathway and the great possibilities of the powerful linear electric motor will permit the magnetic suspension express trains to develop truly fantastic speeds -- up to 500 kilometers an hour.

Figure 1 The First Soviet Magnetic Suspension Car.

However, in the city, where distances between stops are not very great, such high speeds are not needed. Therefore, the tasks that developers are faced with are much more modest: to increase the average speed of city and suburban transportation by a factor of 2 or 3. This will make it possible to bring the carrying capacity of new transportation to 25,000 passengers an hour, that is, to close the gap between the maximum possibilities of usual city means of conveyance and the minimum possibilities of a subway.

The express train that "flies on magnetic waves" also possesses other advantages: it is off-street transportation; it does not interfere with traffic; it is absolutely nontoxic; and, what is extremely important, it costs one-sixth to one-fourth as much as a subway.

There is no doubt: the concept is extremely attractive. So, when will all this come out from behind the confines of the testing grounds, and when will the new express trains begin to operate? I asked these questions of Yu. Sokolov, the director of the electromagnetic transportation work at the "Transprogress" All-Union Scientific-Research and Design Institute."

"Don't expect the 'miracle' express train to appear tomorrow. The development of a new type of transportation system that uses the principle of magnetic suspension over a roadbed, instead of the traditional combination of wheels and rails, requires the solution of a number of complicated technical problems. But the embodiment of the concept in reality is not far away either. The task of expanding the sphere of application of new means of transportation for cities and suburbs was formulated by the 26th CPSU Congress. The projects in this area continue."

The solution of these problems, as PRAVDA has written, is being worked on by specialists not only in Moscow, but also in Leningrad, Kiev, Novosibirsk, Alma-Ata, Stavropol' . . .

Figure 2. This Is the Way the Alma-Ata Express-Magnetoplane Will Look

By the beginning of the 21st Century, this promising type of transportation will become as common on our city and suburban main routes as streetcars are today. Express trains on electromagnetic suspension will provide service to the more intense routes: from a city to an industrial area, from a city to a recreational area, from a city to an airport, or from a city to a suburb.

The utilization of this kind of transportation is extremely promising in regional-production complexes and recreation areas. Having flown to Simferopol', for example, you could get to the sanatorium on the beach in some 15 minutes. And if you happened to be in Feodosiya, let us say, and the day suddenly turned cloudy, then why not use the magnetoplane and, in that same 15 minutes, get to the sunny shores of Yevpatoriya . . .

But let us return to reality. This year, at the institute's testing grounds at Ramenskoye, tests will be continued on the same bogie trucks, then the whole "undercarriage" -- the coupling of these five bogie trucks together -- and, finally, the car itself. Meanwhile, institute associates are conducting various types of research -- in laboratories -- on special test stands. Automatic control systems have to be worked out for the electromagnetic road and for the express train itself. Smooth acceleration and braking of the train must be learned and accident situations must be foreseen so that they can be prevented.

In short, there is much work. But it is interesting and fascinating. And each associate of the institute that I have had occasion to meet mentally visualizes the express train of the future swiftly flying along the simple trestle.

9645
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DELAYS IN FUEL DELIVERIES REPORTED

Coal, Petroleum Delays

Moscow GUDOK in Russian 17 Dec 81 p 1

[Text] Coal. The deficit is large. Freight loading is less than the task by more than 1.5 million tons, including 570,000 tons on the Donetsk line, 430,000 on the Kemerovo, 150,000 on the Alma-Ata and 75,000 on the Tselina. The railroad workers on these main lines did not supply fully or in a timely manner empty cars to the miners. And at the same time, the miners were not up to the mark: the shortfall in loading was more than 1 million tons of coal because the coal was not presented for transport.

Poor organization of freight unloading is severely aggravating the situation with freight handling resources. Each day now more than 19,000 gondola cars stand idle all day on approach lines and common use areas, while an additional 14,000 gondola cars are waiting for freight handling bays to become available. There are especially a lot of freight cars--1,700 per day--which are being detained by Ministry of Ferrous Metallurgy enterprises. Also, the Ministry of Agriculture is detaining 1,200 cars per day and the Ministry of Power and Electrification is detaining 500 cars per day. Don't these people understand that by letting the cars stand idle they are undercutting themselves? Stoppages in freight unloading forced the Ministry of Railways to reduce overall freight loading to provide maximum support to the coal miners' needs for empty cars. During the second ten-day period of the month, this procedure allowed average daily fuel loading to increase by 80,000 tons, compared to the first 10 days.

Petroleum Products. The deficit is 1.2 million tons. There aren't enough empty freight cars. Once again, unloading is the stumbling block, particularly at maritime transshipment points. Just at the Baltic Trans-Shipment Point during the past 14 days there were 6,000 fewer tank cars filled than required by the plan. For the rail network as a whole, just on 15 December there were 1,300 fewer tank cars filled than had been planned. What kind of timely return of empty tankage can there be, when the work is in such a state?

We should note that shipment of liquid fuel is being delayed not only by the shortage of empty cars. The petroleum refineries at Angarsk, Komsomol'sk-na-Amure, Kremenchug, Lisichansk and Fergana are not presenting freight for transport. It is their fault that 4,800 tank cars of fuel were not sent to consumers.

Coal Delays on East Siberian Line

Moscow GUDOK in Russian 17 Dec 81 p 1

[Article by GUDOK correspondent V. Seseykin "Difficult Coal for the East Siberian Line"]

[Text] Irkutsk. It was getting close to lunchtime, but the third through train with coal which normally came at that time, had not arrived. T. Benediktova, the assistant station master at Azey knew that things were not going as well as might be hoped with the miners. While the daily plan called for loading 527 freight cars, the miners had ordered only 500. And they warned that increased shipments were not envisaged since the faces were narrow and only two excavating machines were operating, instead of four. Roughly the same situation existed that day at the Cheremkhovo field, the second large coal field of the "Vossibugol" [East Siberian Coal] association.

Things had not gone badly for the subcontractors right up until October. It appeared that nothing would prevent them from shipping fuel evenly and continuously. But suddenly in October there was a stoppage--the East Siberian line did not meet the plan.

After this, the subcontractors' representatives gathered together many times to discuss the situation which had arisen. They investigated the questions of why the stoppage had occurred and whose fault it was. Some figures were mentioned: during October, the Azey coal field refused to use approximately 1,500 coal cars and did not utilize several hundred of the cars which had already come to the mines (there was a shortage of just about 2,000 cars to fulfill the monthly task).

In November, the subcontractors could not repair this omission. During the month, they got behind the plan by more than 40,000 tons of coal. The miners justified themselves by saying that the open pits had seams without much coal. In any event, there was a sharp decline in fuel shipments. The railroad workers at some stations began receiving refusals of cars. Also, the concentrating factories let the railroad down in the first days of November: they did not accept what had been mined and did not requisition cars to ship the cleaned coal.

So it continued during the second ten-day period in November. Each day, just at the Kas'yanovka station, the miners sent in requisitions for an average of 20 cars fewer than what the plan had envisaged.

Why is this so? It turned out that there was no coal in some of the pits adjacent to various stations at the Cheremkhovo coal field. The directors of the mining association openly declared this at various conferences and meetings with railroad workers.

The miners were supposed to have a definite fuel reserve, so that in the event of any interruption in mining, they could ship coal from the reserve. But the reserve was nowhere to be found: they had already shipped it. Last year the subcontractors had shipped 600,000 tons over and above the task. This year they shipped an extra 100,000 tons. That is, overfulfilling the plans worked to the disadvantage of the subcontractors themselves.

The miners at the Cheremkhovo coal field have great hopes for opening a new pit. But this question is still in the discussion stage. Therefore, the main work load falls on the Azey coal field, which is newer, more potent and is still expanding.

At the beginning of December, the miners at the Azey field sharply increased their speed in mining coal and need more than 600 cars each day to ship the coal. But so far, the railroad workers are providing an average of 500 cars per day. The conclusion is obvious: we must help the Tayshet division supply empty cars to the pits at the Azey coal field.

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